GROUP ART UNIT: 1796

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF APPEALS AND INTERFERENCES

APPELLANTS' BRIEF

Ronald Scott Beckley, et. al.

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MICHAEL ADDITION COMPOSITIONS

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	:	Ronald Scott Beckley, et. al.			
Application No.	:	10/660,186	**Group No.**	:	1796
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Filed:	:	9/11/2003	**Examiner**	:	Michael Bernshteyn
For	:	MICHAEL ADDITION COMPOSITIONS			

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BRIEF FOR APPELLANTS

This is an appeal from the rejection by the Examiner dated May 21, 2009, finally rejecting claims 1-6, 11-13, 15, 16, and 18-26. Appellants filed a Notice of Appeal pursuant to 37 CFR § 1.191 on August 21, 2009.

The Commissioner is authorized to charge payment of the fee for filing of this Appeal Brief to Deposit Account 18-1850.

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REAL PARTY IN INTEREST [37 CFR 41.37(c)(1)(i)]:

This application and the invention disclosed therein are the property of Rohm and Haas Company, a Delaware corporation.

RELATED APPEALS AND INTERFERENCES [37 CFR 41.37(c)(1)(ii)]:

There are no appeals or interferences related to the subject matter of this application.

STATUS OF CLAIMS [37 CFR 41.37(c)(1)(iii)]:

The status of the claims is as follows:

Allowed:	none
Objected to:	none
Cancelled:	7-10, 14, and 17
Pending:	1-6, 11-13, 15, 16, and 18-26
Withdrawn:	none
Rejected:	1-6, 11-13, 15, 16, and 18-26
On Appeal:	1-6, 11-13, 15, 16, and 18-26

STATUS OF AMENDMENTS [37 CFR 41.37(c)(1)(iv)]:

Claims 1-6, 11-13, 15, 16, and 18-26, the pending claims, are set out in the Claims Appendix. Appellants submitted amendments to claims on April 07, 2009, in response to a non-final rejection. No further amendments have been submitted. The Claims Appendix shows the claims as amended by the amendments submitted on April 07, 2009.

SUMMARY OF CLAIMED SUBJECT MATTER [37 CFR 41.37(c)(1)(v)]:

The following is a concise summary of the invention, with references to pages and line numbers of the specification in which each feature of the invention is disclosed.

As recited in claim 1

A curable mixture (p. 1, line 25) comprising at least one multi-functional Michael donor (p. 1, line 26), at least one multi-functional Michael acceptor (p. 1, lines 26-27), and at least one anion of a Michael donor (p. 1, line 27), wherein said curable mixture comprises 5% or less by weight non-reactive volatile compounds (p. 1, line 28) that have boiling points of 120°C or less (p. 12, line 15), based on the total weight of said curable mixture, wherein each Michael acceptor functional group in said multifunctional Michael acceptor is a residue of acrylic acid, methacrylic acid, fumaric acid, or maleic acid (p. 6, lines 4-5).

As recited in claim 21

The curable mixture of claim 1, wherein said curable mixture does not contain any of the catalysts usually used for Michael addition reactions (p. 11, lines 13-16).

<u>As recited in claim 25</u>

The curable mixture of claim 1 wherein at least one of said multi-functional Michael donor has two or more functional groups with the structure

$$-R^5-\overset{\displaystyle R^6}{\overset{|}{C}}H-R^7$$

wherein R^5 is $-\overset{O}{\overset{\|}{C}}-$ or $-O-\overset{O}{\overset{\|}{C}}-$; R^7 is $-\overset{O}{\overset{\|}{C}}-R^8$ or $-\overset{O}{\overset{\|}{C}}-O-R^8$ or $-C{\equiv}N$; and R^6 and R^8 are, independently, H, alkyl, aryl, or alkaryl (p. 7, line 22 to p. 8, line 1); and

wherein said curable mixture does not contain any of the catalysts usually used for Michael addition reactions (p. 11, lines 13-16).

<u>As recited in claim 26</u>

The curable mixture of claim 25, wherein at least one of said anion of a Michael donor is an anion of a Michael donor that has the same composition as at least one of said multi-functional Michael donor (p. 13, lines 3-11).

GROUNDS FOR REJECTION TO BE REVIEWED ON APPEAL [37 CFR 41.37(c)(1)(vi)]:

The grounds for rejection to be reviewed on appeal were stated by the Examiner in the above-mentioned final rejection as follows:

Claims 1-6, 11-13, 15, 16, 18-20, and 22-24 were rejected under 35 USC §103(a) as being unpatentable over Irie (US Patent 5,959,028) in view of Straw (US Patent Application Publication 2003/0165701).

Claims 21, 25, and 26 were rejected under 35 USC §103(a) as being unpatentable over Irie (US Patent 5,959,028) in view of Straw (US Patent Application Publication 2003/0165701) and in view of Leake (US Patent 6,521,716).

No other grounds of rejection are currently pending in the present case.

ARGUMENT [37 CFR 41.37(c)(1)(vii)]:

I. Non-Obviousness of claims 1-6, 11-13, 15, 16, 18-20, and 22-24 over Irie in view of Straw

Appellants submit that there is at least one feature of present claim 1 that is not taught or suggested by either Irie or Straw. That feature is "wherein said curable mixture has 5% or less by weight non-reactive volatile compounds that have boiling points of 120°C or less, based on the total weight of said curable mixture."

In the present paper, "high solids" will mean that a composition has 5% or less by weight non-reactive volatile compounds that have boiling points of 120°C or less, based on the total weight of the composition.

First, Appellants submit that Irie does not teach or suggest curable compositions that are high solids. Appellants submit that every curable composition disclosed by Irie has 43% or more of solvent.

Irie teaches an invention that "provides a curable resin composition" that comprises three ingredients, labeled "(a)" and "(b)" and "(c)" (col. 2, lines 7-14). Irie defines these ingredients as follows:

> *"(a) a component containing a plurality of alpha, beta-ethylenically unsaturated carbonyl groups in the molecule;*
>
> *(b) an acrylate polymer containing a plurality of malonate-terminated pendant groups in the molecule; and*
>
> *(c) a catalyst capable of promoting the Michael reaction."* (col. 2, lines 7-14).

Irie further teaches, under the heading "Curable resin compositions" (col. 6, line 10) as follows:

> *"All of components (a), (b), and (c) are dissolved or dispersed in an organic solvent conventionally used in the coating industry."* (col. 6, lines 19-21)

The term "solvent" is well known in the coatings industry to mean a substance that is volatile and is non-reactive with the components of the coating. The examples of solvents given by Irie (col. 6, lines 21-32) are well known as volatile, non-reactive substances. Thus, Irie teaches compositions in which (a), (b), and (c) are dissolved or dispersed in a volatile, non-reactive substance.

Additionally, it is well known that, in order for a composition to have ingredients that are "dissolved or dispersed" in a solvent, as in Irie's invention, the amount of solvent in the composition must be much more than 5% by weight of the composition. This point is verified in the declaration by Dr. Chen of April 1, 2009 (paragraph 13), where Dr. Chen notes that having the ingredients "dissolved or dispersed" in a solvent means that the composition is necessarily "low solids."

Irie's Examples illustrate the generalization that all of Irie's compositions have far more than 5% solvent. For instance, in Production Example 1, Irie discloses making an example of ingredient (b) as a solution of 49.4% nonvolatiles (col. 6, line 57) (i.e., with 50.6% volatile compounds). Irie proceeds to disclose a "curable resin composition" in Example 1, as follows:

Ingredient	solid parts	volatile parts
Production Example 1 (b)	200	205
PETA (a)	50	
TBABr (c)	2	
TINUBIN	10	
SANOL LS-400	5	

Thus, Irie's Example 1 has 205 parts volatiles out of a total of 472 parts, for a volatile amount of 43%. Irie teaches that Examples 2-30 follow Example 1 (col. 8, line 48). Thus, Irie is teaching that Examples 2-30 have volatile amounts of approximately 43%.

Irie also discloses Example 31. In Example 31, Irie discloses that a steel plate is first coated with three coatings, none of which are disclosed to contain any of Irie's (a), (b), or (c) (col. 12, lines 41-64). That is, none of those first three coatings is a curable

composition according to Irie's invention. The first coating is a commercially-available "cathodic electrodeposition paint"; the second is a commercially-available "sealer" that Irie applies as a "midlayer paint." The third is a "base coat composition" described at col. 12, lines 53-65. This "base coat composition" contains melamine resins and acrylic varnish, and it does not contain any of Irie's ingredients (a), (b), or (c). Consequently, none of the first three coatings in Irie's Example 31 is a curable composition of his invention, and the amount of solvent contained in any of these first three coatings is not relevant to the present case.

In Example 31, Irie teaches that after the first three coatings are applied, a coating of his invention is applied. Irie states:

> *"Then, the solution of Example 1 adjusted to Ford cup #4 viscosity of 30 seconds was applied electrostatically onto the base coat wet-on-wet, and baked both films simultaneously at 140°C for 25 minutes." (col. 12, line 66 to col. 13, line 2).*

It is well known in the coatings art that the viscosity of a composition is "adjusted" by adding more solvent to reduce the viscosity of the composition. Thus, the solution of Irie's curable resin composition that is disclosed to be used in Example 31 has even higher proportion of non-reactive volatile compounds than the solution disclosed in Example 1.

To summarize Irie's teachings: Irie discloses that his ingredients (a), (b), and (c) are dissolved or dispersed in solvent, and all of the curable compositions presented in Irie's Examples are solutions that have amount of solvent that is approximately 43% or higher. Thus, Irie teaches compositions that contain much higher quantities than 5% of volatile, non-reactive compounds. Irie does not teach or suggest the use of compositions with 5% or less of non-reactive volatile compounds.

Second, Appellants submit that Straw does not teach or suggest curable compositions that are high solids. Appellants submit that every curable composition disclosed by Straw has 27.5% or more by weight of water.

At the beginning of his "Background of the Invention" section, Straw makes a general statement about compositions that cure by Michael addition:

> *Coating compositions curable by Michael reaction have several advantages. Liquid polymers and oligomers can be cross-linked to form tough hard coatings, so that the coating composition need have little or no volatile organic solvent to achieve a viscosity suitable for spray applications* (paragraph 3).

Near the end of that "Background" section, after discussing various features of compositions that cure by Michael addition, Straw concludes:

> *Consequently, there is need for water borne Michael curing coating compositions having a long pot life* (paragraph 11).

A person of ordinary skill would draw two conclusions from Straw's disclosure. First, a person of ordinary skill would conclude that Straw teaches away from all of the compositions discussed in his" Background," including those compositions with little or no volatile organic solvent. Therefore a person of ordinary skill would not find it obvious to combine any of the features described in Straw's "Background" with any other teachings, including those of Irie.

Second, a person of ordinary skill would consider that, while Straw mentions the existence of compositions that have little or no volatile organic solvent, Straw does not teach compositions that have little or no water. Straw's discussion in paragraph 3 is limited to compositions that lack organic solvent. The remainder of Straw's entire disclosure is about water-borne compositions and the benefits that arise from their use. Because Straw teaches compositions that contain water, and because water is a non-reactive volatile compound that has boiling point of 120°C or less, the compositions taught by Straw contain non-reactive volatile compound that has boiling point of 120°C or less.

Straw's compositions are described by Straw as "water born" (abstract and paragraph 13). As verified in the declaration by Dr. Chen of April 1, 2009 (paragraph 7),

a water borne composition has more than 5% water by weight. Also, in each of Straw's Examples, his curable composition has 27.5% or more water by weight.

To summarize Straw's teachings: Straw mentions compositions with little or no organic solvent, but he teaches away from their use. Also, Straw does not teach or suggest compositions with little or no water. Consequently Straw does not teach or suggest compositions with 5% or less of volatile non-reactive compound.

The combination of Irie and Straw, therefore, does not teach or suggest compositions that have 5% or less of volatile non-reactive compound. Therefore, Appellants submit that this feature of present claim 1 is not taught or suggested by Irie or Straw, alone or in combination, and consequently Appellants submit that present claim 1 is not obvious over Irie in view of Straw. That is, because this feature is not taught in the cited references, the Examiner has not presented a proper *prima facie* case for obviousness.

Appellants also note that in the rejections over Irie in view of Straw, the Examiner has not discussed the feature, also recited in present claim 1, of the presence of "at least one anion of a Michael donor." Because this feature has not been discussed in the rejections of record over Irie in view of Straw, Appellants submit that a proper *prima facie* case for obviousness has not been made by the Examiner. (The Examiner has discussed anions of Michael donors in the context of a different rejection, to which Appellants respond herein below, but the Examiner has not discussed that feature in context of the rejection over Irie in view of Straw).

Appellants further submit that present claims 2-6, 11-13, 15, 16, 18-20, and 22-24 are not obvious over Irie in view of Straw, for the same reasons applied to claim 1, because each is dependent, directly or indirectly, on claim 1.

Appellants wish to address the arguments presented by the Examiner as follows.

In the Advisory Action of July 28, 2009, the Examiner states that Straw teaches that a coating composition need have little or no volatile organic solvent. The Examiner then concludes that it would have been obvious to "employ little or no volatile compounds as taught by Straw in Irie's composition." Appellants submit that the Examiner's conclusion is incorrect for the two reasons presented herein above. First, the

fact that Straw teaches away from using compositions with little or no volatile organic solvent makes it not obvious to combine such teaching by Straw with any other teaching, including Irie's. Second, Straw only teaches compositions with little or no "organic" solvent. Straw does not teach compositions that lack every type of volatile non-reactive compound, because Straw teaches compositions that contain water.

In the Final Rejection of May 21, 2009, in paragraph 10, the Examiner discusses removal of volatile compounds. In general, Appellants submit that it is not relevant to compare process steps that remove volatile compounds in Straw's disclosure with process steps that remove volatile compounds that are described in the present specification. Instead, Appellants submit that present claim 1 is a composition claim, and in order to present a proper case for obviousness, the Examiner must point out how the composition itself is rendered obvious by the prior art.

In one example of solvent removal, both Straw (paragraph 39) and the present specification (e.g., p. 10, lines 6 and 12) describe steps in which a volatile compound is removed from a single ingredient. Straw's paragraph 39 describes removal of volatiles from a Michael acceptor and not from a curable composition (as verified by the Declaration of Dr. Chen of April 1, 2009, paragraph 5). While the present specification describes the use of that single ingredient in a high-solids composition, Straw describes the use of that single ingredient in a water borne composition. In Straw's Examples 3 and 4, the malonate polymer is modified using "method 3" (paragraph 60), which is an embodiment of the process described in Straw's paragraph 39, including the removal of volatiles (paragraph 65). The resulting Michael acceptor is then mixed with water (paragraphs 66 and 72). That is, Straw teaches removal of volatiles during the preparation of the Michael acceptor followed by mixing with water to form a water borne composition. Consequently, Appellants submit that Straw's removal of volatiles during the preparation of Michael acceptor does not teach or suggest any curable composition (i.e., composition containing both Michael acceptor and Michael donor) that is other than water borne.

In another example of solvent removal in paragraph 10 of the Final Rejection of May 21, 2009, the Examiner discusses Irie's disclosures of making hard dry film that is

cured, at room temperature or by baking. The present specification also discloses cured compositions (for example, p. 20, lines 3-4). Appellants submit that the fact that a cured coating has little or no volatile compounds is irrelevant to discerning the nature of the original composition prior to cure. It is very common for a coating composition to have a large amount of volatile compound at the time that a layer of the coating is applied to substrate, and for that volatile compound to evaporate during a process of drying and curing. Irie's Example 31 illustrates such a coating; a solution of Irie's Example 1 (having at least 43% volatile compound, as argued herein above) is applied and then baked (col. 13, line 2). Therefore, any disclosure that a cured composition has little or no volatiles does not tell whether or not the curable composition (i.e., the composition prior to curing) had a low level or a high level of volatile compounds. Consequently, Appellants submit that Irie's disclosure of cured composition does not constitute a disclosure of a curable composition that has 5% or less non-reactive volatile compounds.

In paragraph 11 of the Final Rejection of May 21, 2009, the Examiner stated the following:

> *Therefore, it is the Examiner's position that one having ordinary skill in the art could successfully design a high-solids coating by simply removing the solvent from Irie's composition.*

Appellants note that the Examiner's position is opposed by that of Dr. Mai Chen, expressed in her Declaration of April 1, 2009. Dr. Chen has a Ph.D. in Chemistry and long experience in industrial research and development. In paragraphs 9-11, Dr. Chen explains that creating a high-solids coating composition is not a simple matter of removing solvent from a previously-known low-solids coating composition. In view of Dr. Chen's Declaration, Appellants submit that it is not obvious to create a high-solids composition based on Irie's disclosure.

In the Non-Final rejection of January 09, 2009, the Examiner stated, "Irie does not disclose that the curable mixture comprises 5% or less by weight non-reactive volatile compounds" (p. 5, lines 3-4). Appellants agree with this particular statement.

(Appellants note that in a paper submitted on August 28, 2006, Appellants characterized Irie's Example 31 as disclosing compositions with "at least 10%" solvent. Appellants submit that the figure of "at least 10%" was based on an analysis of the "base coating" in Irie's Example 31, which does not contain any of Irie's (a), (b), or (c). Thus, Appellants submit that the characterization of Irie's Example 31 presented herein above is correct and accurate. Appellants note that the statement made in their paper of August 28, 2006, that Irie's compositions contain at least 10% solvent, is a true statement, since Irie's compositions contain at least 43% solvent.)

In sum, Appellants submit that the Examiner has not presented a valid *prima facie* case for obviousness of present claims 1-6, 11-13, 15, 16, 18-20, and 22-24 over Irie in view of Straw.

I. Non-Obviousness of claims 21, 25, and 26 over Irie in view of Straw and Leake

A. Non-Obviousness of claim 21 over Irie in view of Straw and Leake

Appellants submit that it would not be obvious to combine the teachings of Leake regarding cure without catalyst with the teachings of Irie.

Leake teaches that cure without catalyst can only be performed under certain specific, limited circumstances. The compositions of Leake's invention contain either a Michael acceptor that is "doubly activated," or a Michael donor that is selected from a specific group of Michael donors, or both. Leake describes the compositions of his invention as follows (Abstract):

> *The double bonds of the Michael acceptor (A) are activated by two adjacent electron withdrawing groups. Alternatively or additionally, the Michael donor (B) contains beta-ketoamide, enamine carboxylate, enamine amide, pyrazolone, isoxazolone, hydantoin, rhodanine, thiosubstituted unsaturated ester, thio-substituted lactone or phosphonite or phosphinite ester groups.*

Leake describes in further detail his meaning of a Michael acceptor "activated by two adjacent electron withdrawing groups" in his description of Michael acceptors from col. 2, line 13 to col. 4, line 8, illustrated by his structures (I), (II), (XLV), and (III). A common feature of these acceptors is that one carbon atom of the carbon-carbon double bond is attached to two different electron-withdrawing groups. Leake refers to the carbon-carbon double bond in (I), (II), and (XLV) as "doubly activated" at col. 3, line 42, and he teaches that such structures are "more reactive in Michael curing systems than are polymers containing acrylate or methacrylate ester groups" (col. 3, lines 44-46). Leake further teaches that the carbon-carbon double bond in (III) is also "doubly activated" (col. 3, line 55).

The Michael donors mentioned in Leake's abstract are discussed in greater detail by Leake in col.4 through col. 8, illustrated by Leake's structures (IV) through (XIX). Leake describes these structures as "substantially more active in Michael curing coatings" than various previously-known Michael donors such as acetoacetates, malonates, and amines (col. 8, lines 41-44).

Leake teaches that only a few of his Michael donors are sufficiently active that they can cure without base catalyst. Leake states that all of his "substantially more active" Michael donors "are capable of giving more rapid curing at ambient temperature and/or curing with less powerful alkaline catalysts" (col. 8, lines 41-48). Leake goes on to state the following:

> *No base catalyst is required when using Michael donors containing thio-containing esters or lactone groups of formula (XIV) or (XV) or phosphonite or phosphinite esters of formulae (XVI to (XIX)* (col. 8, lines 48-53).

Leake presents a similar teaching as follows:

> *Many of the coating, adhesive or sealant compositions of the invention preferably contain a basic catalyst, although Michael donors for formulae (XIV) to (XIX) cure readily without the use of basic catalyst* (col. 21, lines 50-53).

Leake teaches that, even though all his inventive compositions either have acceptor that is "doubly activated" or have donor that is "substantially more active," only a few of his inventive compositions can cure without base catalyst. Specifically, only those compositions having a particular subset of Leake's "substantially more active" Michael donors (i.e., his structures XIV to XIX) can cure without base catalyst. Thus Leake teaches that a certain set of unusually reactive Michael reactants is required in order to accomplish cure without base catalyst.

In contrast, Irie teaches Michael donor (his component "b") that has malonate-pendant groups. Leake teaches that Leake's Michael donors are substantially more active than malonates. Leake also teaches that only his most active donors may be cured without base catalyst. Therefore, according to Leake's teaching, if the method of curing without base catalyst (taken from Leake) were used with Irie's compositions, the resulting composition would not cure.

Consequently, Appellants submit that it would not be obvious to try to cure a composition containing Irie's Michael donor and Irie's Michael acceptor without base catalyst, because, according to Leake's teachings, such a composition will not cure. Therefore, Appellants submit that it would not be obvious to combine Leake's teachings regarding cure without base catalyst with Irie's teachings of Michael donor and Michael acceptor, and so Appellants submit that present claim 21 is not obvious over Irie in view of Straw and Leake.

In response to the above argument (as presented, for example, in Appellants amendment of July 16, 2009), the Examiner has stated (for example, in the Advisory Action of July 28, 2009) the following:

> *All these references are analogous art because they are from the same field of endeavor concerning new coating resin composition curing by Michael addition reaction.*

Appellants have not argued that Leake and Irie are from different fields of endeavor. As presented herein above, Appellants have argued that Leake teaches that only certain specific Michael donors allow cure without base catalyst, and Irie does not use those Michael donors. Appellants submit that these specific teachings of Irie and Leake render

their combination non-obvious, whether or not they are considered to be in the same field of endeavor.

Appellants note an additional reason for the non-obviousness of present claim 21 over Irie in view of Straw and Leake. The present claims involve the presence of anion of Michael donor. The presumed importance of this feature is explained in the present specification at p. 11, lines 3-12): it is contemplated by Appellants that the anion of Michael donor is capable of catalyzing the Michael addition reaction, even in the absence of compounds that are usually used to catalyze Michael addition. That is, the composition recited in present claim 21 involves more than simply removing the usual catalyst; it also involves including the anion of Michael donor.

Irie does not teach any composition that has the anion of a Michael donor at the same time it has the absence of a usual Michael catalyst. Irie teaches the following:

> *As is well known, the Michael reaction normally requires the presence of a strong base to strengthen the acidity of methylene proton by the conversion of adjacent carbonyl group to a enolate anion* (col. 4, lines 21-24).

In this passage, Irie is describing the well-known mechanism of Michael addition, in which the first step is removal of the proton from the methylene group that is between the two carboxyl groups in the malonate group (which is attached to the Michael donor). That is, the strong base, in Irie's teachings, produces the anion of Michael donor. In this passage, Irie clearly teaches that the presence of strong base is required in order for the anion of Michael donor to exist.

Therefore, even if the usual base catalyst were left out of Irie's composition, the result, according to Irie's teaching, would not be the composition of the present invention. The importance of Irie's teaching is that the lack of strong base catalyst necessarily results in lack of anion of Michael donor. Therefore, the issue of the anion of Michael donor provides another reason why present claim 21 is not obvious over Irie in view of Straw and Leake.

B. Non-Obviousness of claim 25 over Irie in view of Straw and Leake

Because present claim 25 is dependent on present claim 21, Appellants submit that the arguments presented herein above regarding present claim 21 also apply to present claim 25 and provide sufficient reasons why present claim 25 is not obvious over Irie in view of Straw and Leake.

In comparison with present claim 21, present claim 25 has the additional feature of requiring Michael donor that has functional groups selected from a recited list of specific functional groups. Appellants submit that the feature of the required specific functional groups provides an additional reason for the non-obviousness of present claim 25 over Irie in view of Straw and Leake.

The Michael donor functional groups that are required to be present in the composition of present claim 25 are different from any of the "substantially more active" Michael donor functional groups described by Leake. Specifically, the Michael donor functional groups recited in present claim 25 are outside of Leake's structures (XIV) to (XIX). As argued herein above, Leake teaches that the only Michael donors that allow the Michael reaction to proceed without base catalyst are those with his structures (XIV) to (XIX). Therefore, according to Leake's teaching, the donor functional groups recited in present claim 25 will not cure in the absence of base catalyst. Consequently, Appellants submit that Leake teaches away from the combination of absence of base catalyst with the use of the donor functional groups recited in present claim 25.

Because of this teaching away, Appellants submit that present claim 25 is not obvious over Irie in view of Leake.

C. Non-Obviousness of claim 26 over Irie in view of Straw and Leake

Because present claim 26 is dependent on present claim 25, Appellants submit that the arguments presented herein above regarding present claim 25 also apply to present claim 26 and provide sufficient reasons why present claim 26 is not obvious over Irie in view of Straw and Leake.

In comparison with present claim 25, present claim 26 has the additional feature of requiring presence of an anion of a Michael donor that is the same as a multi-

functional Michael donor that is also present in the composition. Appellants submit that the feature of the specific anion of Michael donor provides an additional reason for the non-obviousness of present claim 25 over Irie in view of Straw and Leake.

As argued herein above regarding present claim 21, Irie teaches (col. 4, lines 21-24) that the presence of base catalyst is required in order to have a composition that has anion produced from Michael donor. There is no teaching in Irie of compositions with the presence of anion of Michael donor in the absence of base catalyst.

The teachings of Leake do not contribute to obviousness of present claim 26 because Leake's teachings of cure without base catalyst are limited to compositions with Michael donors that are different from those required in present claim 26 (as argued in detail herein above regarding present claim 25).

In sum, none of the cited references, alone or in combination, teaches or suggests a composition that has the combination of features recited in present claim 26: absence of usual Michael catalyst; presence of specific Michael donor functional groups; and presence of anion of Michael donor that has the same composition as a multifunctional Michael donor that is present in the composition.

Conclusion

Appellants request that present claims 1-6, 11-13, 15, 16, and 18-26 be allowed at this time.

Respectfully Submitted,

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Date: October 10, 2009

CLAIMS APPENDIX [37 CFR 41.37(c)(1)(viii)]

Pending Claims

1. A curable mixture comprising at least one multi-functional Michael donor, at least one multi-functional Michael acceptor, and at least one anion of a Michael donor, wherein said curable mixture comprises 5% or less by weight non-reactive volatile compounds that have boiling points of 120°C or less, based on the total weight of said curable mixture, wherein each Michael acceptor functional group in said multifunctional Michael acceptor is a residue of acrylic acid, methacrylic acid, fumaric acid, or maleic acid.

2. The curable mixture of claim 1 wherein said multi-functional Michael donor has at least two acetoacetoxy functional groups and wherein said multi-functional Michael donor has a skeleton selected from the group consisting of
   (a) polyhydric alcohols that have molecular weight 200 or greater,
   (b) oligomers that have weight-average molecular weight of 400 to 1,000, and
   (c) polymers that have weight-average molecular weight of 1,000 or more.

3. The curable mixture of claim 1 wherein said anion of a Michael donor comprises a reaction product of an acetoacetoxy functional molecule with an alkali metal alkoxide, wherein said acetoacetoxy functional molecule has a skeleton selected from the group consisting of
   (a) polyhydric alcohols that have molecular weight 200 or greater,
   (b) oligomers that have weight-average molecular weight of 400 to 1,000, and
   (c) polymers that have weight-average molecular weight of 1,000 or more.

4. The curable mixture of claim 1 wherein said multi-functional Michael acceptor has a skeleton selected from the group consisting of
   (a) polyhydric alcohols,

(b) oligomers that have weight-average molecular weight of 400 to 1,000, and

(c) polymers that have weight-average molecular weight of 1,000 or more;

with the proviso that when said multi-functional Michael acceptor has said skeleton (a), the molecular weight of said multi-functional Michael acceptor is 5,000 or less; and with the further proviso that when said multi-functional Michael acceptor has said skeleton (b) or said skeleton (c), the weight-average molecular weight of said multi-functional Michael acceptor is 5,000 or less.

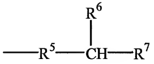
5. The curable mixture of claim 1 wherein the reactive equivalent ratio of said curable mixture is in the range of 0.1:1 to 2:1.

6. The curable mixture of claim 1 wherein the donor anion ratio of said curable mixture is in the range of 0.5% to 10%.

7. - 10. (cancelled)

11. The curable mixture of claim 1, wherein at least one of said anion of a Michael donor is an anion of a Michael donor that has the same composition as at least one of said multi-functional Michael donor.

12. The curable mixture of claim 1 wherein at least one of said multi-functional Michael donor has two or more functional groups with the structure



wherein R^5 is $-\overset{O}{\overset{\|}{C}}-$ or $-O-\overset{O}{\overset{\|}{C}}-$; R^7 is $-\overset{O}{\overset{\|}{C}}-R^8$ or $-\overset{O}{\overset{\|}{C}}-O-R^8$ or $-C\equiv N$; and R^6 and R^8 are, independently, H, alkyl, aryl, or alkaryl.

13. The curable mixture of claim 12 wherein at least one of said multi-functional Michael donor is selected from the group consisting of
    (i) polyhydric alcohols in which one or more hydroxyl group is linked to an acetoacetate group through an ester linkage, and
    (ii) compounds containing one or more functional groups selected from the group consisting of acetoacetate, acetoacetamide, cyanoacetate, and cyanoacetamide; wherein said functional groups are attached to one or more skeleton selected from the group consisting of castor oil, polyester polymer, polyether polymer, acrylic polymer, methacrylic polymer, and polydiene polymer.

14. (cancelled)

15. The curable mixture of claim 2 wherein at least one said multi-functional Michael donor has a skeleton that is a polyhydric alcohol that has molecular weight of 200 or more.

16. The curable mixture of claim 1 wherein alkali metal hydroxides, alkali metal alkoxides, quaternary ammonium hydroxides, diaza compounds, guanidine compounds, amidines, pyridine, and imidazoline are absent or substantially absent from said mixture.

17. (cancelled)

18. The curable mixture of claim 4 wherein at least one of said multi-functional Michael acceptors has a skeleton that is a polyhydric alcohol.

19. The curable mixture of claim 1 wherein said multi-functional Michael acceptor has a skeleton selected from the group consisting of
    (a) polyhydric alcohols,

(b) oligomers that have weight-average molecular weight of 400 to 1,000, and

(c) polymers that have weight-average molecular weight of 1,000 or more;

with the proviso that when said multi-functional Michael acceptor has said skeleton (a), the molecular weight of said multi-functional Michael acceptor is 2,000 or less; and with the further proviso that when said multi-functional Michael acceptor has said skeleton (b) or said skeleton (c), the weight-average molecular weight of said multi-functional Michael acceptor is 2,000 or less.

20. The curable mixture of claim 1 wherein said multi-functional Michael acceptor has a skeleton selected from the group consisting of

(a) polyhydric alcohols, and

(b) oligomers that have weight-average molecular weight of 400 to 1,000;

with the proviso that when said multi-functional Michael acceptor has said skeleton (a), the molecular weight of said multi-functional Michael acceptor is 1,000 or less; and with the further proviso that when said multi-functional Michael acceptor has said skeleton (b), the weight-average molecular weight of said multi-functional Michael acceptor is 1,000 or less.

21. The curable of claim 1, wherein said curable mixture does not contain any of the catalysts usually used for Michael addition reactions.

22. The curable mixture of claim 1, wherein said curable mixture comprises 2% or less by weight non-reactive volatile compounds, based on the total weight of said curable mixture.

23. The curable mixture of claim 1, wherein said curable mixture comprises 1% or less by weight non-reactive volatile compounds, based on the total weight of said curable mixture.

24. The curable mixture of claim 1, wherein said curable mixture is substantially free of non-reactive volatile compounds.

25. The curable mixture of claim 12, wherein said curable mixture does not contain any of the catalysts usually used for Michael addition reactions.

26. The curable mixture of claim 25, wherein at least one of said anion of a Michael donor is an anion of a Michael donor that has the same composition as at least one of said multi-functional Michael donor.

EVIDENCE APPENDIX [37 CFR 41.37(c)(1)(ix)]

Declaration of Dr. M. Chen, submitted with Appellants' Amendment on April 07, 2009 (4 pages)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

DN A01654

In re application of: Beckley *et. al.*

Serial No.: 10/660,186 Art Unit.: 1796 Confirmation No. 5800

Filed: 09/11/2003 Examiner: Michael Bernshteyn

For: MICHAEL ADDITION COMPOSITIONS

Declaration of Mai Chen Under 37 CFR 1.132

[0001] I, Mai Chen, of Hoffman Estates, IL, 60195, received my Ph.D. in Chemistry from University of Southern California in 1992. I have been employed by Rohm and Haas Company or its predecessors and affiliates, including Morton International, since 1992, currently as a Distinguished Scientist in Adhesives & Sealants research and development. I am a coinventor on several US Patents relating to adhesives, including, for example, US 7,119,144, which involves Michael addition compositions.

[0002] Re: US Patent Publication 2003/0165701 ("Straw")

[0003] I have read and understood US Patent Publication 2003/0165701 ("Straw"). In particular, I have examined paragraph #39, in which Straw states, "In a next step, the volatiles should be removed, for instance under a vacuum."

[0004] The subject of Straw's publication is a water borne curable coating composition (see Straw's abstract, and Straw's paragraph #13, where he defines his invention).

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Appl. No. 10/660,186 Docket No. A01477
Declaration by Mai Chen

[0005] The statement in Straw's paragraph #39 does not mean that water is removed from the curable coating composition of Straw's invention. Straw's paragraph #39 describes a method of preparing a single ingredient in Straw's composition. Straw's paragraph #39 describes how to make a specific Michael acceptor, namely an olefin-modified malonate derivative that has sulfonates incorporated into it. This acceptor, according to Straw's paragraph #39, is made by a reaction that is conducted in a volatile organic solvent, and the last step in the preparation of the specific Michael acceptor is to remove volatiles from the reaction mixture. That is, Straw's paragraph #39 teaches removal of the volatile reaction medium from the specific Michael acceptor. Straw's paragraph #39 does not teach removal of volatiles from the curable composition.

[0006] Straw teaches that his compositions are "water borne." In each of his examples, the composition that is curable is the composition that is formed by adding Straw's "pack1" to his "pack 2." In all of Straw's examples, the amount of water by weight percent varies from 27.5% (Example 2) to 37.3% (Example 1). In Straw's Example 2 through Example 5, the "pack 2" is a pure Michael acceptor made by the method of Straw's paragraph #39. In those examples, the curable composition is formed by mixing pack 2 with pack 1, and in those examples the weight percent water in the curable composition is between 34% and 35%.

[0007] The curable compositions of Straw's invention definitely contain more than 5% by weight of water because they are "water borne." A "water borne" composition typically has 40% or more water by weight. In any case, a composition that is "water borne" must have more than 5% water by weight.

[0008] High Solids Compositions

[0009] I am familiar with a wide variety of compositions for coatings and adhesives, including compositions that are generally described as "high-solids" compositions. The definition of "high-solids" varies somewhat, but a composition with

5% or less by weight of non-reactive volatile compounds will qualify as a "high-solids" composition by any widely-accepted definition.

[0010] To make an effective high-solids coating or adhesive, it is generally necessary to do more than simply remove solvent from a low-solids coating. Usually, in a low-solids composition that is suitable as a coating or an adhesive, the ingredients are dissolved or dispersed in a solvent such as water or an organic solvent. Normally, if a particular low-solids composition is known, and it is desired to make an analogous high-solids coating, much more needs to be done besides removing the solvent. To make the analogous high-solids coating, it is usually necessary to make changes one or more of the ingredients. Normally, any polymers that were suitable in a low-solids coating must be either altered or replaced to make them suitable for a high-solids coating (often, for example, by lowering the molecular weight). Also, the additives that are suitable for a known low-solids composition must be either altered or replaced if the analagous high-solids composition is to be effective.

[0011] In sum, the materials that are normally required for high-solids compositions are different from those used in low-solids compositions. Thus, if it is known that certain materials are suitable for use in a low-solids composition, it is not obvious to a person of ordinary skill in the art that those same materials would be suitable for use in a high-solids composition.

[0012] US Patent 5,959,028 ("Irie")

[0013] I have read and understood US Patent 5,959,028 ("Irie"). Irie teaches a "curable resin composition" (col. 2, line 2). Irie teaches that, in his composition, all of the components "are dissolved or despersed in an organic solvent conventionally used in the coatings industry" (col. 6, lines 19-20). Irie's curable resin composition is, therefore, a low-solids composition. Just because Irie's ingredients are suitable for use in his low-

solids composition does not make it obvious to a person of ordinary skill in the art that his ingredients would therefore be suitable for use in a high-solids composition.

[0014] Irie's composition includes his component (b), which is an acrylate polymer having a plurality of malonate-terminated pendant groups and having number-average molecular weight of 1,000 to 50,000 (col. 4, lines 14-17). Irie's composition also contains component (a), which may optionally be another polymer (col. 3, line 36).

[0015] The fact that Irie's composition contains at least one polymer provides a specific reason why it is not obvious to a person of ordinary skill in the art that Irie's ingredients would be suitable for use in a high-solids composition. As stated above, it is common that a polymer suitable for a low-solids composition must be altered or replaced in order make an effective high-solids composition. It would require extensive experimentation to characterize Irie's ingredients to find out whether Irie's ingredients would be suitable for use in a high-solids composition. Therefore, it would not be obvious to a person of ordinary skill in the art to design a high-solids coating by simply removing the solvent from Irie's composition.

[0016] I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under the United States Code and such willful statements may jeopardize the validity of any patent application or patent issued thereon.

M Chen
Mai Chen

Date: 4/1/2009

RELATED PROCEEDINGS APPENDIX [37 CFR 41.37(c)(1)(x)]

none